CLAIMS

1. A method for verifying and identifying users, and for verifying users' identity, by means of an authentication device capable of transmitting, receiving and recording audio and ultrasonic signals, and capable of converting said signals into digital data, and performing digital signal processing, the method comprising:

   a) recording on said authentication device voice pattern(s) of one or more authorized user(s);

   b) storing on said authentication device user information providing identifying details of said authorized user(s);

   c) inputting to said authentication device a vocal identification signal from a user; and

   d) comparing the voice pattern of said vocal identification signal with the recorded voice pattern(s) of said authorized user(s), and if a match is detected issuing an indication that said user is identified as an authorized user.

2. A method according to claim 1, wherein a predefined pattern of audio and/or ultrasonic signals is transmitted by said authentication device, whenever a match of voice patterns is detected.

3. a method according to claim 1, wherein the authentication device emits a predefined pattern of light signals from a light-emitting device, to indicate a match of voice pattern.

4. A method according to claim 1, wherein the authentication device is a credit card comprising a magnetic strip and/or a smart chip, the method further comprising the following steps:

   a) inputting to said authentication device a vocal identification signal from a user; and

b)   comparing the voice pattern of said vocal identification signal with the recorded voice pattern(s) of said authorized user(s), and if a match is detected activating said magnetic strip and/or a smart chip and allowing a magnetic card reader to read the card information therefrom.

5. A method according to claim 1, wherein the authentication device is utilized to permit the access of user(s) to a computerized system, the method consisting of:

a)   providing a computerized system comprising:

a.1)   an audio signal input device capable of receiving ultrasonic signals;

a.2)   a sound processing device suitable to receive inputs from said audio signal input device, and to receive audio and ultrasonic input signals, and capable of converting said signals into digital data;

a.3)   a data base containing of voice patterns of authorized users;

a.4)   an application capable of receiving digital data inputs from said sound processing device, of activating other applications, and of transmitting digital data over network links;

b)   transmitting from said authentication device an ultrasonic signal comprising the recorded voice pattern;

c)   receiving said ultra sonic signal by said audio signal input device;

d)   processing said ultrasonic signal and extracting said recorded voice pattern therefrom; and

e)   comparing said recorded voice pattern with the voice patterns stored in said database of authorized users, and if a match is detected enabling access to said computerized system.

6. A method according to claim 1, wherein the authentication device is utilized to permit the access of user(s) to a computerized system, the method consisting of:

a) inputting a vocal identification signal of a user to an authentication device;

b) transmitting from said authentication device an ultra sonic signal comprising said vocal identification signal and user information stored on said authentication device;

c) receiving said ultrasonic signal by said audio signal input device, and processing said ultrasonic signal to extract therefrom said vocal identification signal and said user information;

d) fetching from a database the voice pattern of the authorized user associated with said user information; and

e) comparing the fetched voice pattern to the transmitted voice pattern and;

e.1) if a match is detected enabling access to said computerized system;

e.2) if a match is not detected, disabling the access to said computerized system.

7. a method according to claim 6, wherein the user verification is performed at a remote server connected to a computer network and/or the Internet, comprising:

a) inputting a vocal identification signal of a user to an authentication device;

b) transmitting from said authentication device an ultra sonic signal comprising said vocal identification signal and user information stored on said authentication device;

c) receiving said ultrasonic signal by an audio signal input device, and processing said ultrasonic signal to extract said vocal identification signal and said user information;

d) transmitting said vocal identification signal and said user information to said remote server, via said computer network and/or the Internet over a secure link;

e) receiving said vocal identification signal and said user information by said remote server;

f) fetching from a database the voice pattern of the authorized user associated with said user information; and

g) comparing the fetched voice pattern with the transmitted voice pattern, and;

    g.1) if a match is detected, enabling access to said remote server;

    g.2) if a match is not detected, disabling the access to said remote server.

8. A method according to claim 1, wherein the authentication device is utilized to permit the access of user(s) to a computerized system, the method consisting of:

a) inputting a vocal identification signal of a user to an authentication device;

b) verifying the user identity, on said authentication device, by performing the following steps:

    b.1) processing said vocal identification signal to obtain the user's voice pattern;

    b.2) comparing said voice pattern to the voice pattern stored on said authentication device, and transmitting an ultrasonic signal comprising a match or mismatch indication, and the user information;

    b.3) receiving said ultrasonic signal by an audio signal input device, and processing said ultrasonic signal to extract said match or mismatch indication and said user information; and

    b.4) enabling access to said computerized system whenever a match indication is extracted from said ultrasonic signal.
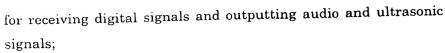
9. A method according to any one of claims 5 to 8, wherein the vocal identification signal, and the user information, are converted into digital data and modulated into an ultrasonic signal utilizing Frequency Shift Keying techniques.

10. A method according to any one of claims 5 to 9, wherein the audio signal input is received through telephony infrastructures, thereby allowing the identification of users through said telephony infrastructures.

11. A method according to claim 10, further comprising an Interactive Voice Response device/application for allowing access of authorized users to personal information, and/or manipulating said information.

12. A method according to claim 1, wherein voice recognition is utilized for the verification of authorized users, comprising a verification procedure in which the pronunciation of a predefined word or phrase is checked.

13. A method according to claim 1, wherein voice recognition is utilized to input into the authentication device vocal instructions received from the user, comprising:
   a)   playing a vocal menu, from the authentication device, where said vocal menu comprises an ordered list of possible options;
   b)   inputting a vocal signal comprising the options selected by the user to said authentication device; and
   c)   performing the task(s) associated with the selected option(s).

14. A method according to claim 13, further comprising carrying out arithmetic calculation in combination with the vocal menu, by performing the following steps:
   a)   playing a vocal menu consisting one or more arithmetic operations;

b) vocally selecting a desired arithmetic operation;

c) vocally inputting the numeric value(s) on which said arithmetic operation should be performed;

d) calculating the result of said arithmetic operation; and

e) vocally outputting said result.

15. A method according to claim 14, further comprising calculating the extra payments to be paid in addition to a basic payment for a service, by activating an extra payment calculation function, vocally inputting the basic payment sum, calculating the extra payment to be paid according to said sum, and vocally outputting the extra payment calculation result.

16. A method according to claim 1, wherein voice recognition is utilized to input vocal instructions received from the user, to the authentication device, comprising instructions for launching a selected application, or for performing selected tasks on a computerized system, comprising:

a) inputting to said authentication device an audio signal, received from the user, comprising instruction to carry out a desired task;

b) performing voice recognition procedures to recognize said desired task, spoken by the user;

c) transmitting an ultrasonic signal comprising instructions for carrying out said desired task to the computerized system;

d) receiving said ultrasonic signal by said audio signal input device, and processing said ultrasonic signal to extract said instructions; and

e) performing said instructions.

17. An authentication device capable of transmitting, receiving and recording audio and ultrasonic signals, and capable of converting said signal into digital data, and performing digital signal processing, said

authentication device comprising:

a)   an input device capable of receiving audio and ultrasonic input signals and of outputting an analog electric signal;

b)   an analog-to-digital converter suitable to receive analog electric signals from said input device, and to output equivalent digital signals;

c)   a memory device for storing data;

d)   a press button for activating the device operation;

e)   a processing unit suitable to receive inputs from said press button, analog-to-digital converter, and to input and output digital data from/to said memory device;

f)   a digital-to-analog converter suitable to receive digital signals from said processing unit, and to output equivalent analog signals; and

g)   an output device capable of receiving analog electric signals and of transmitting audio and ultrasonic input signals, that receives analog signals from said digital to analog converter.

18. An authentication device according to claim 17, comprising a light-emitting device in which a pattern of light pulses is issued by the processing unit to indicate a match.

19. An authentication device according to claim 17, comprising a magnetic strip enabling said authentication device to carry out financial transactions, in which said magnetic strip is activated by said processing unit whenever a match of the voice pattern is achieved.

20. An apparatus comprising a device according to claim 17, for permitting or denying access to a computerized system, comprising:

a)   a computerized system comprising:

a.1)   a sound processing device for receiving audio and ultrasonic signals, and for converting said signals into digital signals, and

for receiving digital signals and outputting audio and ultrasonic signals;

a.2) an input device for inputting audio and ultrasonic signals and for outputting their equivalent analog electric signals;

a.3) means for connecting the output of said input device to said sound processing device;

a.4) software means for processing digital signals; and

a.5) a database of voice patterns of authorized users.

21. An apparatus according to claim 20, in which the input device is connected to telephony infrastructures, for inputting audio signals over telephone lines.

22. A credit-card sized apparatus capable of receiving and processing audio signals, comprising:

a) a power source;

b) an input device capable of receiving human voice inputs; and

c) a data processing device capable of processing said human voice inputs.

23. An apparatus according to claim 22, further comprising a device for outputting human-audible sounds.

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